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COMPLETE SPECIFICATION.

Package.

We, WINGFOOT CORPORATION, a corporation organised under the laws of the State of Delaware, United States of America, of 1144 East Market Street, Akron, Ohio, United States of America, hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

10 This invention relates to an improved package which might be described as a hammock pack because the contents are suspended or slung in the package by means which at least in part comprises 15 what resembles a hammock. There is no friction between the package and its contents, and the hammock absorbs shocks to which the package may be subjected.

This invention consists in a package 20 which comprises a frame, an object, the perimeter of the frame being larger than the periphery of the object and a heat-stretchable flexible film or sheet which is stretched completely over an open end of 25 the frame and snugly supports the bottom of the object with the edges of the film supported from the upper edge of the frame.

The invention also consists in a package which comprises an object and two frames 30 supporting two flexible films or sheets, one of which films is held between and extends across open ends of the frames and the other of which covers the top of the upper frame the object being supported between the 35 two films or sheets.

The invention still further consists in a package which comprises a frame, an object or objects held between sheets or films of flexible wrapping material, with at least 40 one sheet covering and supported from an open end of the frame whereby to provide between the object or objects and the frame a small expanse of sheet material which forms a shock absorbing support for the 45 object or objects.

The package may comprise a single cell

or compartment or may be divided into several cells; each containing one or more pockets which contain the material to be packaged. The hammock is preferably formed of two sheets of heat-stretchable 50 plastic material, one of which is formed under the article or articles to be packaged and the other of which is formed over the top of the article or articles, the sheets preferably being united around the edge of 55 each individual article. The sheet material may be moisture-tight and impermeable to gases, or it may be permeable to gases and merely dust-tight. On the other hand, it may be perforated if desired. Thus, a 60 variety of different sheet materials may be used.

The package is particularly designed for the shipment of soft perishables, such as peaches, plums, apricots, tomatoes, figs, 65 pears, bunches of grapes, avocados, persimmons, cup cakes, and other fruits, vegetables, or other foodstuffs, and fragile articles, such as eggs, Christmas-tree ornaments and glassware, such as vases. A 70 wide variety of other materials may be packaged in the package of this invention for display purposes, or because of the resilient support it affords, or for any other reason. 75

A chief advantage of the hammock pack lies in the suspension of the articles which lessens shocks encountered in shipping, such as the vibration of a plane or railroad train, and the jars which result from rough 80 manual handling or dropping. The reduction or elimination of shock lessens breakage and bruising. Ordinarily, a dust-tight film will be used to keep the articles clean. This eliminates soiling which results from 85 customer handling. A moisture-tight film may be used where desirable. In the packaging of certain edibles, such as freshly picked fruits and vegetables, a film permeable to carbon dioxide may be re- 90 quired. The film itself may be gas perme-

able, or it may be perforated before or after packaging to provide for the escape of gases. For certain fruits it may be found desirable to use a film impermeable to oxygen to delay ripening. Ordinarily, the articles will be individually sealed in separate pockets. Then if one article is broken—e.g., an egg—or one article becomes diseased—e.g., stem-end rot forming on an orange—the damage is localized and surrounding articles are not affected.

The package may be made of cardboard, corrugated board, plastic, or the like. The outer walls of the package may be rigid, and the cells formed by wire partitions. Any suitable partitioning material may be employed. The outer package may be of any one of several general types which will be more fully explained below. The preferred form of outer container is composed of two cellular halves, the upper of which fits down on the lower with the cells in the two halves mating to form a larger cell or cells. In this preferred form there are two films between these two halves which snugly enclose the wrapped articles.

A variety of different heat-sealable sheet materials may be used for the hammock. The pockets which hold the articles are stretched into the films which hold them as will be explained in what follows. Films such as rubber hydrochloride film (Pliofilm), (Registered Trade Mark) polyvinyl films (such as Vitafilm) (Registered Trade Mark), a film of copolymer of a vinyl and vinylidene halide (such as Saran (Registered Trade Mark), for example), a film of rubber and wax (Parafilm), may be used. For display purposes, a transparent film will be required. A preferred film is rubber hydrochloride film which is easily stretched when heated to a relatively low temperature and which may be sealed by simply applying pressure to the heated film.

The pocket is generally preferably formed by using the film in a heated condition and pressing it against the article. If preferred, the film might first be stretched by a plunger or vacuum or the like and the article fitted into the pocket thus formed. "Pliofilm" is preferred for such an operation because after stretching, it retracts even after cooling, so that even though the pocket formed by the plunger or vacuum is larger than required to enclose the article, the film will gradually shrink on to the article after it has been placed into the pocket until the film forms a snug fit around the article. In the preferred package the pockets are just the size and shape of the article and snugly enclose it so that it does not rattle around in the pocket. An article such as a tomato, for example, would be bruised and pro-

bably ruined if allowed to rattle around in a pocket larger than itself.

For articles, such as glassware, pockets may be stretched into the film before the film is brought into contact with the articles.

The invention will be further described in connection with the accompanying drawings, in which:—

Fig. 1 is a more or less diagrammatic view in elevation, of the elements which go into one form of package made according to this invention;

Fig. 2 is an elevation of the elements assembled;

Fig. 3 is an elevation of the completed package;

Fig. 4 is an elevation of a modified package which is often preferred;

Fig. 5 is an exploded view of a modification of the package shown in Fig. 4;

Fig. 6 is a detail of the edges of the package shown in Fig. 5;

Fig. 7 is an elevation of another modified package;

Figs. 8 and 9 are side views, at right angles to one another, of still another modified package;

Figs. 10 and 11 are a plan view and elevation of a further modification; and

Fig. 12 is a view in perspective of another package with a part of the outside of the package broken away to show the contents.

A very simple form of the invention is illustrated in Figs. 1—3. Fig. 1 is a diagrammatic view of the materials employed to package an article 1, which is elliptical in shape, and may, for example, be a tomato. An open-ended cylindrical or cubical frame of plied-up, stiff-walled, cardboard 2 is used together with sheets of "Pliofilm" 3 and 4. Both films are heated. The film 4 is placed over (so as to extend across) an open end of the frame, the object 1 is pressed down into it, and the film 3 is pressed down over the top of the object, and the two films are pressed together around the periphery of the object with sufficient force to unite them. The pressure applied to the films stretches them so that they conform to the top and bottom of the object and fit snugly around it. To unite the films in the area 5 around the object, a sealing device, such as two plungers with heated heads, may be used, one of which comes down around the top of the article and the other of which comes up through the frame 2 and presses against the bottom of the film. If preferred, the films may be united in this manner before they are brought into proximity with the frame 2.

The outer edges of the films 3 and 4 are now fastened down against the walls of the

frame 2 to form the finished package illustrated in Fig. 3. Any suitable adhesive may be used. It will be seen that the heat-sealed areas 5 extend in from the walls 2 so that the portions of the films 3 and 4 which cover the article do not contact the frame. The article is actually suspended from the upper edge of the wall of the frame. The film forms a cradle or hammock which is slung from the frame. The film areas 5 have sufficient resilience to absorb or cushion any shock to which the package is subjected. Although the frame is preferably round or square in cross section, it may be hexagonal, triangular or any shape.

A somewhat modified structure is shown in Fig. 4. Here an article 10 held between sheets 11 and 12 which are heat-sealed together at 13, is protected by cylindrical frames 14 and 15. The outer edges of the film 11 are turned back against the cylinder 15, and the outer edges of the film 12 are turned back against the cylinder 14. If preferred, both films may be turned up or down against the cylinder 15 or against the cylinder 14. They are fastened to the cylinder by any suitable adhesive. In this type of structure the upper half of the article as well as the lower is protected by a frame. The two frames are held together by any suitable means, as, for example, an encircling band of kraft paper or a stout rubber band or a suitable adhesive tape or the like.

Like protection of both the top and bottom halves of the article is obtained by stacking two or more units such as shown in Fig. 8, on top of one another and holding them together by any suitable means. In this case the frame 2 must be of sufficient height to prevent the articles from coming into contact with one another.

Figs. 5 and 6 show an alternative arrangement in which an article 20 is similarly suspended between films 21 and 22 which are heat-sealed at 23. Upper and lower cylinders 24 and 25 are of glass, porcelain, plastic, etc. Fig. 6 is an enlarged detail showing how the edges of the cylinders may be mortised at 26 and 27 so that the edges of the film are tightly clamped between them. With this arrangement it is not necessary to fasten the extremities of the films 21 and 22 to the cylinders. All that is necessary is that the cylinders be held together by suitable means. A clamp may be used.

A further alternative arrangement is shown in Fig. 7. Here an object 30 is supported from above and below, but the films are applied in a somewhat different manner. There are two frames 31 and 32. There are also two films: 33 which extend across and is held between open ends of the

frames and 34 which is placed over and extends across the top open end of the top frame and fastened to it at the edges by adhesive, a rubber band or other suitable means. The edges of the film 33 may be fastened to either cylinder by any suitable means. The two cylinders are held together in any suitable manner as by clamping or adhesive tape. In this arrangement the article is cradled between the two films, but the films do not come in contact with one another. They are not tightly sealed around the edges of the object. Such a structure is less apt to be moisture-tight than where the films are sealed together. It may be gas filled, but the gas will escape more or less readily, depending upon the materials used in forming the package. The film 33 is stretched at the centre so as to suitably receive the article 30. The upper film 34 may be stretched to conform to the top of the article although a perfectly flat film may be used satisfactorily where the top of the article does not project an appreciable distance above the top of the frame.

Figs. 8 and 9 are a plan view and elevation of an elongated package which comprises two frames 40 and 41, of corrugated board. It is not necessary that either frame have a top or a bottom, although preferably either a top or bottom is used in at least one of the frames to prevent the completed container from folding. There are two films 42 and 43 held between the frames. In the final package the edges of the films will be fastened to one or both of the frames 40 and 41. The central portion of each film is stretched to form an elongated pocket, and in this pocket are a number of roundish objects which may be tomatoes, cakes, etc. These objects are cradled against shock, are held closely to one another so that there is no abrasion of their skins or surfaces by the rubbing of one upon the other, and they are held in a dustproof and possibly also moisture-tight wrap ready for shipment. When they reach the market, they are protected against damage or contamination through handling by prospective customers. They are thus protected in transit and while on display and in storage also, if stored.

Figs. 10 and 11 show a further alternative arrangement. A rigid frame 50 is formed of corrugated board. There are two or more such frames stacked on top of one another. As shown in Fig. 11, intermediate frames 51 are generally deeper than the end frames. Dividing partitions 52 are, likewise, of corrugated board. Between each two of the frames are two films which cradle objects 53 which are separated from one another by the partitions. These objects may all be of the same

size or of different size and may be irregular in shape. The films, of which only the upper one 54 is visible in the plan view, are pocketed and fit over the top and bottom of the individual objects. There are as many pockets in each film as there are cells or compartments in one of the frames. The dividing partitions 52 are flush with the top and bottom edges of the frames 50 so that when they are stacked one on top of another, the pressure between the partitions holds the films taut and the articles are individually supported from the partitions. The edges of the film are held to the outside frames 50 and 51 in any suitable manner. The frames are held together by suitable means. It is not necessary that the partitions contact the films although this structure is preferred.

In Fig. 12 the container is made of two halves 60 and 61 and the contents are divided into nine cells by partitions 62. Eggs or other objects 64 are cradled between two sheets of transparent wrapping material of which only the upper sheet 65 is shown. Both sheets are held between the two halves of the container. The two halves of the container are held together by the adhesive strip 66.

In Figs. 4, 5, 7, 9, and 11 the frames are spaced somewhat to clarify the construction. In practice there will ordinarily be no space between them.

Thus, the invention is capable of embodyment in a variety of different forms. Transparent, colorless film may be used, or the film may be colored and transparent. It may be pigmented. Film which is opaque or suitably colored may be used to protect the objects from the light. The surface of the film may be frosted so that the film is not transparent. Instead of partitions between the various compartments, a single wire or other dividing means may be used at the level of the edge of the enclosing frame for the purpose of squeezing the films between the frames or for supporting the film, as desired.

Multiple frame packages may be formed embodying the various features disclosed, including features illustrated in Fig. 7.

Although generally in multi-cellular packages the walls of the partitions will be the same height as the walls of the surrounding frame, it is to be understood that this is not essential. For instance, the partitions in the bottom of a package may be taller than the walls of the surrounding frame; then the partitions in the top of the package may be correspondingly shorter so that when the top and bottom of the package are brought together, the partitions meet.

The packages may be small for supplying an individual or small family, for

example, or may comprise many cells when designed for supplying institutions, etc. For instance, an avocado might be shipped in individual containers, and packages of tomatoes for hospitals may comprise a 70 hundred or more cells.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A package which comprises a frame, an object, the perimeter of the frame being larger than the periphery of the object and a heat-stretchable flexible film or sheet 80 which is stretched completely over an open end of the frame and snugly supports the bottom of the object with the edges of the film supported from the upper edge of the frame.

2. A package which comprises an object and two frames supporting two flexible films or sheets, one of which films is held between and extends across open ends of the frames and the other of which covers 90 the top of the upper frame the object being supported between the two films or sheets.

3. A package which comprises a frame, an object or objects held between sheets or films of flexible wrapping material, with at least one sheet covering and supported from an open end of the frame whereby to provide between the object or objects and the frame a small expanse of sheet material which forms a shock absorbing support for 100 the object or objects.

4. A package as claimed in Claim 3 wherein each of the said objects is held with its top and bottom between two sheets of flexible wrapping with at least the bottom sheet supported at its edges by the frame.

5. A package as claimed in Claim 3 or 4 wherein the sheets form between them a pocket which so closely conforms to the shape of an object that there is no movement between the object and either sheet when the package is subjected to a mechanical shock, the portion of the sheets between the frame and the article forming a resilient shock absorbing support between the object and the frame.

6. A modification of the package as claimed in any of the Claims 3 to 5 which comprises a multi-cellular frame, objects to be packaged equal in number to the cells of the frame and positioned therein, a flexible sheet or film stretched over the top of the frame with the edges of the sheet or film united to the outer wall of the frame, the sheet covering individual cells being stretched to conform to the bottom of the respective objects packaged therein, and over the objects a sheet or film so that the objects are supported between the two films 120.

or sheets.

7. A package as claimed in any of the Claims 3 to 6 wherein the said sheets and object or objects are enclosed between two mating frames.

8. A package as claimed in Claim 7 wherein the edges of the sheets are held between the top edges of the walls of one frame and the bottom edges of the walls of the other frame.

9. A package as claimed in any one of

the Claims 3 to 8 wherein the said sheets or films are heat sealed around the periphery of the object or objects.

10. A package as claimed in any one of 15 the previous claims wherein the said sheet or film is of rubber hydrochloride film.

11. A package substantially as described and as illustrated with reference to the accompanying drawings. 20

Dated this 18th day of August, 1947.

MARKS & CLERK,

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[This Drawing is a reproduction of the Original on a reduced scale.]

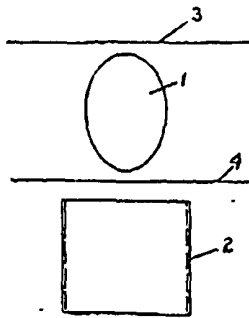


Fig.-1

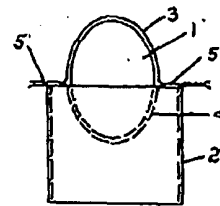


Fig.-2

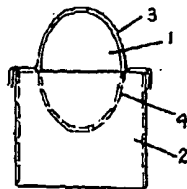


Fig.-3

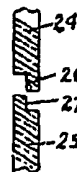


Fig.-6

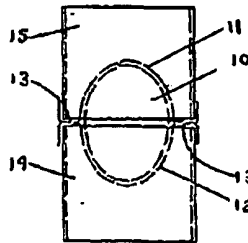


Fig.-4

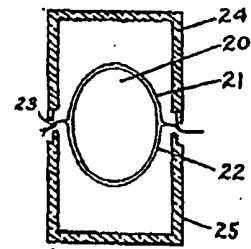


Fig.-5

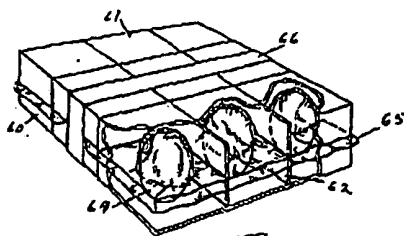


Fig.-12

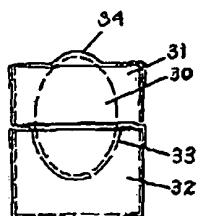


Fig-7

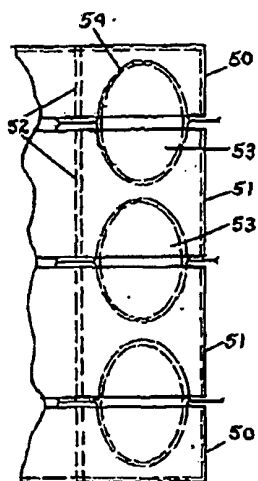


Fig-11

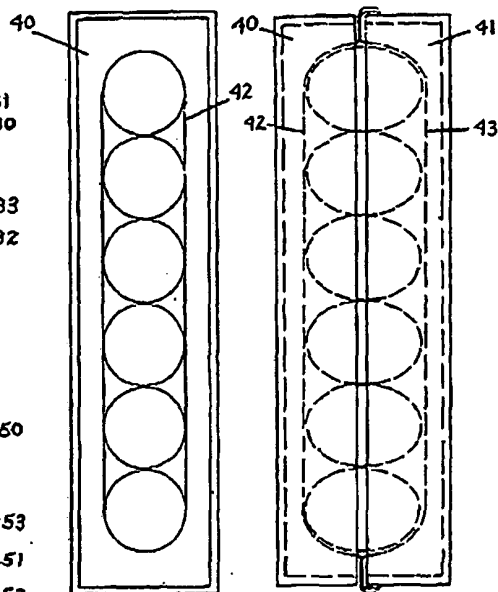


Fig-8

Fig-9

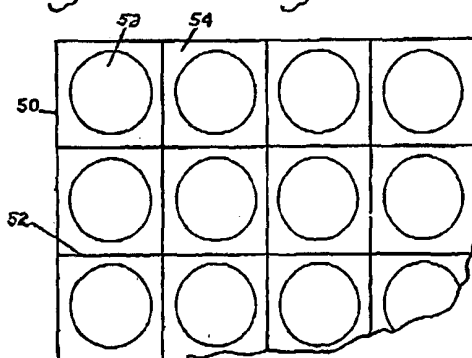


Fig-10

